

**Memorandum Circular**

**No. 98 - 06**

**May 14, 1998**

**To : All Regional Executive Directors**

**SUBJECT : Guidelines in Water Quality Monitoring**

To improve the efficiency and effectiveness in the implementation of your respective water quality (WQ) monitoring programs, it is hereby ordered that:

1. Priority shall be given to the bodies of water indicated in the EMB List of Rivers (Appendix A) for WQ monitoring activities, otherwise, requests for approval accompanied by appropriate justification shall be submitted to the EMB Director prior to commencement of activities. The justification shall include factors such as the presence of industries, existence of urban centers and development activities, etc. within its catchment. As a general rule, creeks need not be monitored, however, if monitoring is sufficiently justified, the name of the main river or exit point i.e. lake or sea should be indicated in the report. Important bays and lakes shall be monitored;
2. High priority shall be given to the three (3) big rivers and fourteen (14) major rivers listed in Appendix B. Each region should monitor at least two (2) rivers (one in the rural and another in an urban area). Preference should be given to rivers indicated in Appendix C;
3. Water quality monitoring shall be done on a regular frequency, i.e., every two weeks for rivers and every month for lakes, reservoirs and bays. If minimal variation is observed in the parameters being

monitored, the activity may be done in a less frequent basis. For example, monitoring of a biologically dead river may be done on a monthly basis;

4. Permanent monitoring sites, regular sampling frequency and the same selected parameters shall be strictly observed/maintained in WQ monitoring activities;
5. WQ monitoring parameters shall be relevant to the present/future use or classification of the monitored water body, e.g., coliform bacteria for waters being used for primary contact recreation; toxic and bacteriological parameters for sources of drinking water; presence of salt in water used for irrigation, etc.;
6. Measurement of pH, dissolved oxygen (DO) and temperature shall be taken in the field every time a sample is collected. DO measurements shall be taken between 9:00 AM and 4:00 PM only. The measured DO value shall be checked against standard saturation DO values. The time of DO determination shall be clearly indicated in the report. All other details in WQ monitoring are contained in the “Manual on Water Quality Monitoring” which shall be observed;
7. River flow rate (cubic meters per second) should be measured during the time of sampling. Stream flow data from NWRB, DPWH, NIA and NPC may be used as reference;
8. Data shall be analyzed by the DENR Regional Office-EMPAS as soon as possible or at least before submitting the report to the EMB. Common statistical parameters required in the quarterly report are the mean and standard deviation given in the following formula:

$$\text{Mean} \quad : \quad \bar{X} = \frac{\sum_{i=1}^n x_i}{n}$$

where:  $x_i$  = values of the data set  
 $n$  = number of values in the data set

i.e. :  $\bar{x} = (x_1 + x_2 + x_3 + \dots + x_n)/n$

Variance :  $s^2 = \sum_{i=1}^n (x_i - \bar{x})^2 / (n-1)$

Standard

Deviation :  $s = [s^2]^{1/2}$

9. Assessment of monitoring results should be accompanied by a general description of the whole stretch of the river or a similar stretch monitored, e.g. whether or not it meets the water quality criteria for such classification. To do this, each parameter is compared with the applicable set of water quality criteria. The highest classification that matches with the set of criteria for all the parameters monitored in a river shall be adopted as its temporary classification. (For example, for a water body to be classified as Class C, all monitored parameters should pass the Water Quality Criteria for Class C).
10. Submission of reports to EMB shall be on a quarterly basis and shall include the data and information collected and analyzed during the period. The existing water classification should be indicated in the report. The location, description and map of the monitoring stations shall be properly documented and submitted to EMB after every establishment of such stations. Old stations shall also be documented. Numbering of stations should start from downstream (e.g. Sta. 1 at the mouth; Sta. 2, 3, 4 going upstream).
11. Results of monitoring at the regional level shall be one of the bases for appropriate action, such as intensifying industrial pollution

control activities in for a particular river as in where water quality fails to meet the prescribed water quality criteria and/or recommending that the effluent standards in that particular river basin be more stringent than the existing standards.

12. In addition to the compulsory requirement in Item 2, field offices shall also conduct a quarterly observation of the river based on the guideline outlined in Appendix D. The report should follow the format in Appendix E. In this case, observations shall be undertaken by the Regional Offices on at least two (2) rivers for every province and one (1) river for every city of the office's jurisdiction. The PENRO shall submit the field observation data to the Regional Office which in turn shall forward the same together with the water quality monitoring data with their analysis to the Environmental Management Bureau.

The Environmental Management Bureau shall monitor compliance of this memorandum circular and shall recommend appropriate actions in relation thereto.

**(Sgd.) VICTOR O. RAMOS**  
Secretary

Annexes omitted